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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,011	07/08/2003	Daniel Lyle Callahan	200308561-1	8183

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EXAMINER	
DINH, TUAN T	

ART UNIT	PAPER NUMBER
2841	

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,011	CALLAHAN ET AL.	
	Examiner	Art Unit	
	Tuan T. Dinh	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20-22* is/are allowed.

6)☒ Claim(s) *3-7,10-17 and 19* is/are rejected.

7)☒ Claim(s) *8-9,18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/21/06 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 3-4, 7,10-13, 16, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaman et al. (U.S. Patent 5,738,531) in view of Bonnefoy (U.S. Patent 4,611,869).

As to claim 3, 16, 19, Beaman et al. discloses an electronic component system as shown in figures 1-5 comprising:

a land grid array module (1-figure 4);

a printed circuit board (10, column 4, line 12) having first and second sides;

an interposer (3, column 4, line 3) disposed between the module (1) and the first side of the printed circuit board (10);

a backing/stiffening plate (19-figure 5) spaced from, and disposed on the second side of the printed circuit board (10) opposite the first side;

a plurality of posts (22) extending through and connecting the module (1), the printed circuit board (10 or 21-figure 5), the interposer (3 or 24-figure 5), and the backing plate (19) relative to each other; and

a spring member (an insulator 23-figure 5 made by a polyimide, see column 4, lines 5-57) disposed between the backing plate (19) and the second side of the printed circuit board (21), and having a first portion (a leg including a crew hole) in secured contact with the backing plate (19) and a second portion (a body of the insulator 23) in unsecured.

Beaman does not disclose the spring member (23) being curved and pressing contact against the second side of the printed circuit board adjacent a center of the printed circuit board, and the curved spring member retains a generally curved shape in both an unassembled state of the system and in an assembled stated of the system.

Bonefoy discloses an apparatus as shown in figures 2-5 comprising a clip (23) having a first portion secured to a printed circuit board (20), and a second portion is unsecured and pressing contact against the second side of the printed circuit board adjacent a center of the printed circuit board (20), the clip retains a generally curved shape in both an unassembled state of the system and in an assembled stated of the system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Bonefoy employed in the system of Beaman in order to provide an isolation and even pressure of forces applied on the PCB.

As to claim 4, Beaman discloses the second portion (the body) of the spring member (23) comprises a central body portion and the first portion (the leg inclidung the crew hole) of the spring member comprises a plurality of leg members radially extending outward from the central body portion with an end of each leg member including a hole (see figure 5) configured for receiving one of the posts (22) to secure the spring member relative to the backing plate (19).

As to claim 7, Beaman discloses the central body portion defines a body of material formed without holes, see figure 5.

As to claim 10, Beaman discloses the spring member (23) is a single member that provides the substantially all of the compressive clamping force on the system.

As to claims 11-13, Beaman et al. discloses a force distributing mechanism as shown in figures 1-5 comprising:

means for securing (3) a land grid array module (1) and a printed circuit board (10) in electrical communication with each other including introducing a contact force between an array of contact elements of the land grid array module (1) and an array of contact elements of the printed circuit board (10);; and

means for maintaining and distributing (23) the contact force substantially uniformly across the contact array of the land grid array module (1) and the contact

array of the printed circuit board (10), the means for maintaining and distributing the contact force being in direct contact with the printed circuit board (10).

wherein the means for securing ***comprises at least one of***:

an interposer (3) disposed between the land grid array module (1) and the printed circuit board (10);

a plurality of load posts (22) extending through each of the land grid array module (1), the printed circuit board (10), the interposer (3), and the means for maintaining and distributing (23) the contact force; and

a stiffening plate (19) disposed on a side of the printed circuit board (10) opposite the interposer (3) and the land grid array module (1), and fixed to the load posts (22) to be spaced from the printed circuit board (10).

Beaman does not disclose the spring member (23) being curved and pressing contact against the second side of the printed circuit board adjacent a center of the printed circuit board.

Bonefoy discloses an apparatus as shown in figures 2-5 comprising a clip (23) having a first portion secured to a printed circuit board (20), and a second portion is unsecured and pressing contact against the second side of the printed circuit board adjacent a center of the printed circuit board (20).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Bonefoy employed in the system of Beaman in order to provide an isolation and even pressure of forces applied on the PCB.

3. Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaman (531) in view of Bonefoy ('869), and further in view of Haselby et al. (U.S. Patent 6,299,460).

As to claim 15, Beaman and Bonefoy disclose all of the limitations of the claimed invention except for the means for securing the module comprising: a plurality of load springs carried on the load posts.

Haselby et al. teaches an assembly as shown in figure 1 comprising posts (34) having spring loads (36, 38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Haselby et al. employed in the system of Beaman and Bonefoy in order to reduce force when the posts applied on the assembly.

As to claim 17, Beaman and Bonnefoy disclose all of the limitations of the claimed invention except for the means for securing the module comprising: a plurality of load springs carried on the load posts.

Haselby et al. teaches an assembly as shown in figure 1 comprising posts (34) having spring loads (36, 38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Haselby et al. employed in the system of Beaman and Bonnefoy in order to reduce force when the posts applied on the assembly.

4. Claims 5-6, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaman ('531) in view of Bonnefoy ('869), and further in view of Shinha et al. (U.S. Patent 6,475,011).

As to claims 5-6, 14, Beaman and Bonnefoy disclose all of the limitations of the claimed invention, except for the legs and the central body portion of the spring member are configured with a curved shape, and the spring member includes the hole of each leg member having an elongate shape configured to permit limited sliding movement of each leg of the spring member relative to each of the posts.

Shinha shows an apparatus as shown in figures 2-8 comprising a curved spring member (270) having legs (274) and a body (273) configured with a curved shape, and the spring member includes the hole (278) of each leg member having an elongate shape configured to permit limited sliding movement of each leg of the spring member relative to each of the posts.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Shinha employed in the system of Beaman and Bonnefoy in order to provide a strong connection and easy for assembly.

Allowable Subject Matter

5. Claims 8-9, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Neither the references cited nor the cited references do disclose the second portion of the spring member comprises a cured central body portion and wherein the backing plate includes *a recessed portion defined in a main body of the backing plate that is configured to receive the first portion ends of the spring member*.

6. Claims 20-22 are allowed.

The following is an examiner's statement of reasons for allowance: Neither the references cited nor the cited references do disclose the second portion of the spring member comprises a cured central body portion and wherein the backing plate includes *a recessed portion defined in a main body of the backing plate that is configured to receive the first portion ends of the spring member*.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

7. Applicant's arguments with respect to claims 3-22 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues:

Beaman et al. does not disclose a spring member, and an insulating member (23) cannot act as spring.

Examiner disagrees because the insulator (23) made by polyimide material having function as an insulating member between a circuit board (10) and a backing plate (19), so the insulator being flex and reduce force that applied between the board and plate, so the insulator (23) has a structure as the spring member as claimed in the invention.

Beaman et al. does not disclose the spring member having a first portion secured to the backing plate and spaced from a second portion, and Bonnefoy does not teach a first portion secured to the backing plate and spaced from a second portion.

Examiner disagrees because in combination of Beaman and Bonnefoy that teaches the teaching of Bonefoy providing a second portion contacted to a second of the circuit board and spaced from the first portion.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Enad Elvin can be reached on 571-272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tuan Dinh
September 28, 2006.

9-28-06.
Tuan Dinh.